

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the subject application. The Office Action of March 13, 2003 has been received and contents carefully reviewed.

By this Amendment, Applicants amends claims 1, 4, 29 and 32, and add new claim 57. Accordingly, claims 1-57 are currently pending in the present application. Reexamination and reconsideration of the application are respectfully requested.

In the Office Action, the Examiner rejected claims 1-5, 7-22, 24, 26, 29-33, 35-50, 52, and 54 under 35 USC § 103(a) as being unpatentable over Koma (US Patent No. 5,608,556), in view of Auman et al. (US Patent No. 6,139,926). Applicants respectfully traverse this rejection.

Claims 1 and 29 are allowable over the cited references in that claims 1 and 29 recite a combination of elements including, for example, "a photo-alignment layer having a pre-tilt angle on at least one of the first and second substrates... wherein at least one of the alignment directions is determined by the photo-alignment layer irradiated by a light." None of the cited references, singly or in combination, teaches or suggests at least this feature of the claimed invention. Accordingly, Applicants respectfully submit that claims 1 and 29, and claims 2-28 and 30-56, which depend therefrom respectively, are allowable over the cited references. More particularly, the Applicants respectfully submit that there is no motivation for one of ordinary skill to combine the cited references and arrive at the claimed invention with any reasonable expectation of success.

①
②

The Examiner states in the Final Office Action dated August 14, 2002 on page 3,

"In this case, although Koma disclose that a potential difference from the display electrode is applied to the orientation control electrode for controlling the orientation of the liquid crystal, Koma does disclose that a "vertical orientation as a surface orientation treatment" (emphasis added) (col. 6, line 12). In other words, the Koma's alignment layer would be treated (e.g., irradiating light over the alignment surface) to form a pretilt angle for vertical orientation. Therefore, it would have been obvious to one of ordinary skill in the art to modify Koma by subjecting the orientation film to the photo alignment as shown by Auman et al."

Applicants respectfully submit that, as best understood, the vertical alignment status of the liquid crystal molecules in Koma is mainly determined by the liquid crystal and the alignment layer used, not by an alignment treatment. In other words, the alignment layer in Koma does not have a pre-tilt angle controlled by a conventional alignment process, such as the rubbing or photo alignment process. Applicants further respectfully submit that, as the Examiner states, it is possible to treat the alignment layer in Koma with one of conventional alignment processes including the rubbing process. However, Applicants respectfully submit that doing so would undermine one of the inventive principles of removing the rubbing process in Koma, or that doing so would result in some form of disclination, if there is a substantial inconsistency between the alignment direction controlled by the slanted electric fields and the alignment direction determined by one of the conventional alignment treatments. Accordingly, Applicants respectfully submit that the Examiners' citation of Auman et al. actually teaches away from the teaching of Koma. Thus, Applicants respectfully submit that claim 1 is allowable. (2)

Applicants further respectfully submit that the present invention has an advantage over Koma in that the present invention can obtain a multi-domain effect without the orientation control electrode, which is a necessary element in Koma and requires more process steps and complicates pixel structures, as claimed in dependent claim 57. In Koma, the orientation control electrode is necessary to align the liquid crystal molecules in predetermined directions without any disclination phenomenon, an example of which is illustrated in Fig. 2 of Koma. Furthermore, the present invention has advantages over a multi-domain liquid crystal display with several domains in a pixel, the domain being formed only by one of conventional alignment processes including the photo-alignment process. For example, in order to form multi-domains in a pixel through the photo-alignment process, it requires many more irradiating processes than the present invention, which uses a combination of the photo-alignment process and the electric field inducing window. Accordingly, Applicants respectfully submit that there is no motivation for one of ordinary skill to combine Koma and Auman et al. and arrive at the claimed invention with any reasonable expectation of success. Applicants respectfully submit that this is a hindsight reconstruction of the present invention, which is improper. (3)

Applicant believes the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited. If the Examiner deems that a telephone conference would further the prosecution of this application, the Examiner is invited to

call the undersigned attorney at the telephone number (202) 496 - 7500. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

Dated: July 14, 2003

Respectfully submitted,

By 

Rebecca Goldman Rudich

Registration No.: 41,786

MCKENNA LONG & ALDRIDGE LLP

1900 K Street, N.W.

Washington, DC 20006

(202) 496-7500

Attorneys for Applicant



30827